

IN THE CLAIMS

1-37. (canceled)

38. (new) A transformed plant cell or part thereof containing a DNA molecule comprising a sequence encoding immature wild-type PAP II designated as SEQ ID NO:4, or wild-type mature PAP II designated as SEQ ID NO:21, or a mutant of SEQ ID NO:4 or 21 having a sequence containing E172 but that differs from SEQ ID NO:4 or 21 in terms of one amino acid substitution, a C-terminal deletion of up to 48 amino acid residues, or a combination of said substitution and said deletion, and wherein said mutant exhibits anti-viral and/or anti-fungal activity.

39. (new) The transformed plant cell of claim 38 wherein said plant cell part is a protoplast.

40. (new) The transformed plant cell of claim 38, wherein said DNA molecule further comprises a sequence that encodes SEQ ID NO:4.

41. (new) The transformed plant cell of claim 40, wherein said DNA molecule comprises SEQ ID NO:3.

42. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes PAP II (1-285, G72D).

43. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes PAP II (1-285, L254R).

44. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes PAP II (1-285, L254A).

45. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes PAP II (1-237).

46. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes PAP II (1-259).

47. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes a mutant of PAP II selected from the group consisting of PAP II (1-237), PAP II (1-238), PAP II (1-239), PAP II (1-240), PAP II (1-241), PAP II (1-242), PAP II (1-243), PAP II (1-244), PAP II (1-245), PAP II (1-246), PAP II (1-247), PAP II (1-248), PAP II (1-249), PAP II (1-250), PAP II (1-251), PAP II (1-252), PAP II (1-253), PAP II (1-254), PAP II (1-255), PAP II (1-256), PAP II (1-257), PAP II (1-258) and PAP II (1-259).

48. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes PAP II (1-253, L253A).

49. (new) The transformed plant cell of claim 38, wherein said DNA molecule comprises a sequence that encodes SEQ ID NO:21.

50. (new) The transformed plant cell of claim 49, wherein said DNA molecule comprises SEQ ID NO:20.

51. (new) A transgenic plant produced from the protoplast of claim 39.

52. (new) The transgenic plant of claim 51, which is a monocot plant.

53. (new) The transgenic plant of claim 52, wherein said monocot plant is a cereal crop plant.

54. (new) The transgenic plant of claim 51, which is a dicot plant.

55. (new) Seed derived from the transgenic plant of claim 51.

56. (new) A DNA molecule comprising a sequence encoding a mutant immature wild-type PAP II designated as SEQ ID NO:4, or a mutant of wild-type mature PAP II designated as SEQ

ID NO:21, or a mutant thereof having a sequence containing E172 but that differs from SEQ ID NO:4 or SEQ ID NO:21 in terms of one amino acid substitution, a C-terminal deletion of up to 48 amino acid residues, or a combination of said substitution and said deletion, and wherein said analog exhibits anti-viral and/or anti-fungal activity when expressed in plants.

57. (new) The DNA molecule of claim 56, comprising a sequence that encodes a mutant of SEQ ID NO:4.

58. (new) The DNA molecule of claim 57, comprising a sequence that encodes a mutant of SEQ ID NO:21.

59. (new) The DNA molecule of claim 56, comprising a sequence that encodes PAP II (1-285, G72D).

60. (new) The DNA molecule of claim 56, comprising a sequence that encodes PAP II (1-285, L254R).

61. (new) The DNA molecule of claim 56, comprising a sequence that encodes PAP II (1-285, L254A).

62. (new) The DNA molecule of claim 56, comprising a sequence that encodes PAP II (1-237).

63. (new) The DNA molecule of claim 56, comprising a sequence that encodes PAP II (1-259).

64. (new) The DNA molecule of claim 56, comprising a sequence that encodes a mutant of PAP II selected from the group consisting of PAP II (1-237), PAP II (1-238), PAP II (1-239), PAP II (1-240), PAP II (1-241), PAP II (1-242), PAP II (1-243), PAP II (1-244), PAP II (1-245), PAP II (1-246), PAP II (1-247), PAP II (1-248), PAP II (1-249), PAP II (1-250), PAP II (1-251), PAP II (1-252), PAP II (1-253), PAP II (1-254), PAP II (1-255), PAP II (1-256), PAP II (1-257), PAP II (1-258) and PAP II (1-259).

65. (new) The DNA molecule of claim 56, comprising a sequence that encodes PAP II (1-253, L253A).

66. (new) A recombinant vector comprising the DNA molecule of claim 56.